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Developing Artificial Neural Networks (ANN) for Falls Detection

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Abstract : The number of older adults is rising rapidly. The world's population becomes aging. Falls is one of common and major health problems in the elderly. Falls may lead to acute and chronic injuries and deaths. The fall-prone individuals are at greater risk for decreased quality of life, lowered productivity and poverty, social problems, and additional health problems. A number of studies on falls prevention using fall detection system have been conducted. Many available technologies for fall detection system are laboratory-based and can incur substantial costs for falls prevention. The utilization of alternative technologies can potentially reduce costs. This paper presents the new design and development of a wearable-based fall detection system using an Accelerometer and Gyroscope as motion sensors for the detection of body orientation and movement. Algorithms are developed to differentiate between Activities of Daily Living (ADL) and falls by comparing Threshold-based values with Artificial Neural Networks (ANN). Results indicate the possibility of using the new threshold-based method with neural network algorithm to reduce the number of false positive (false alarm) and improve the accuracy of fall detection system.

Keywords : aging, algorithm, artificial neural networks (ANN), fall detection system, motion sensorsthreshold
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